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**VIA EMAIL (jane.landretti@wisconsin.gov)**
**AND U.S. MAIL**

Jane R. Landretti
Staff Attorney
Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, WI 53707-7921

Re: Central Sands Dairy, LLC ("CSD") – WPDES Permit No. WI-0063533-02-1

Dear Ms. Landretti:

Pursuant to Paragraphs 1 and 2 of the Settlement Agreement effective July 27, 2017, enclosed is a crop history report for RDO-12 prepared by CSD.

Sincerely,

**MICHAEL BEST & FRIEDRICH LLP**

Cameron F. Field

Enclosure

015646-0001\22081067.1

**Crop History Report**

Central Sands Dairy, per Settlement agreement 7/27/2017.

The following is summary of the cropping history for RDO 12 from 2012 through 2016. RDO 12 is the field immediately north of the Central Sands Dairy and has received manure on a somewhat annual basis over the time being discussed herein. The entire focus is on nitrogen as that is the primary nutrient of concern. All manure nutrient applications are presented as plant available nitrogen per SNAP+ records.

a. **Evidence of crop failure.** Field was corn for silage in 2014. Corn silage yields during the 2014 crop year were 10% off of previous year average and are nearly 20% lower than 2017 crop year corn silage yield for the farm. While not a crop failure, 23.6 ton/a is less than average production. Table 1. Pea crop in 2015, also underperformed relative to average pea production. We experienced a hard frost after flower initiation on RDO 12 which resulted in pod reset. The second set of pods formed close to the ground and were not harvestable. The result was a 2000-4000 lb/a reduction in yield relative to other pea fields during the summer of 2015.
b. **Actual crop yields from RDO 12.**

Table 1. Actual crop yield from RDO 12 from 2012 through 2016.

| | | Crop 1 | | Crop 2 | |
|---|---|---|---|---|---|
| Year | Crop* | Yield | Units | | |
| 2012 | Green bean x 2 | 14,434 | lb/a | 15700 | lb/a |
| 2013 | Potato | 553 | cwt/a | | |
| 2014 | Field corn** | 23.6 | ton/a | | |
| 2015 | Pea/green bean | 4684 | lb/a | 13719 | lb/a |
| 2016 | Potato/alfalfa | 370 | cwt/a | | |

*Fields were planted to either oat or winter wheat cover crop after main harvest

**Field corn was harvested for silage and yield is presented at 65% moisture

c. **Forage quality samples.** No forage quality samples are available for 2014. Average nutrient recovery data for 6 neighboring fields suggest 75 to 85% of the nitrogen applied was removed with the harvested crop, but no specific data is available for the corn silage grown on RDO 12.
d. **Identify the quantity and nutrient content of the manure and commercial fertilizer applied.** Source of nitrogen includes carryover nutrients from previous years applications of manure (Table 2).

Table 2. Estimate year 2 and 3 nitrogen credit from manure applied the previous year

| Year | Crop* | | |
|---|---|---|---|
| 2012 | Green bean x 2 | 26 | lb/a |
| 2013 | Potato | 15 | lb/a |
| 2014 | Field corn** | 0 | lb/a |
| 2015 | Pea/green bean | 29 | lb/a |

| | | | |
|---|---|---|---|
| 2016 | Potato/alfalfa | 7 | lb/a |

Furthermore, current year plant available nitrogen from manure and commercial fertilizer is included (Table 3).

Table 3. Quantity and nutrient content of manure and fertilizers applied to crops on RDO 12 from 2012 to 2016.

| Year | Crop | Product | Amount applied | Product Units | Nutrient content | Content units | N lb/a |
|---|---|---|---|---|---|---|---|
| 2012 | Green bean - Crop 1 | Liquid Manure | 6800 | gal/a | 4.26 | lb/1000 gal | 28 |
| | | Popper | 5 | gal/a | 5 | % | 3 |
| | | 32% UAN | 5 | gal/a | 32 | % | 18 |
| | Green bean - Crop 2 | Liquid Manure | 7400 | gal/a | 4.38 | lb/1000 gal | 34 |
| | | Popper | 5 | gal/a | 5 | % | 3 |
| | | 32% UAN | 5 | gal/a | 32 | % | 18 |
| 2013 | Potato | AMS | 100 | lb/a | 21 | % | 21 |
| | | Urea | 100 | lb/a | 46 | % | 46 |
| | | 32% UAN | 15 | gal/a | 32 | % | 52.5 |
| | | 32% UAN | 10 | gal/a | 32 | % | 35 |
| | | Nitro 9 | 10 | gal/a | 9 | % | 10 |
| | | Nitro 12 | 15 | gal/a | 12 | % | 19 |
| | | Nitro 12 | 10 | gal/a | 12 | % | 13 |
| 2014 | Field corn | Liquid Manure | 12022 | gal/a | 7.26 | lb/1000 gal | 87.28 |
| | | Starter | 10 | gal/a | 18 | % | 20 |
| | | AMS | 150 | lb/a | 21 | % | 31.5 |
| | | 32% UAN | 10 | gal/a | 32 | % | 35 |
| | | 32% UAN | 5 | gal/a | 32 | % | 17 |
| | | 32% UAN | 5 | gal/a | 32 | % | 18 |
| 2015 | Pea | Liquid manure | 8063 | gal/a | 3.7 | lb/1000 gal | 29.8 |
| | | 32% UAN | 2.5 | gal/a | 32 | % | 8.75 |
| | Green bean | Liquid manure | 8055 | gal/a | 2.0 | lb/1000 gal | 16.11 |
| | | Starter | 5 | gal/a | 7 | % | 3.5 |
| | | 32% UAN | 3 | gal/a | 32 | % | 10.7 |
| | | Starter | 1 | gal/a | 7 | % | 0.7 |
| | | Nitro 9 | 2 | gal/a | 9 | % | 1.9 |
| 2016 | Potato/alfalfa | Solid Manure | 8.3 | ton/a | 2 | lb/ton | 16.6 |
| | | Potato Starter | 15 | gal/a | 9 | % | 15 |
| | | Popper | 13 | gal/a | 7 | % | 10 |
| | | AMS | 200 | lb/a | 21 | % | 42 |
| | | 32% UAN | 25 | gal/a | 32 | % | 87.5 |
| | | 32% UAN | 15 | gal/a | 32 | % | 42.5 |
| | | 32% UAN | 10 | gal/a | 32 | % | 35 |
| | | Nitro 9 | 10 | gal/a | 9 | % | 10 |

e. **Identify when manure and commercial fertilizer were applied**

Table 4. Timing of nutrient applications during the 2012 to 2016 crop production years.

| Year | Crop | Product | Time of application | Date of application |
|---|---|---|---|---|
| 2012 | Green bean - Crop 1 | Liquid Manure | preplant | 5/7/2012 |
| | | Popper | planting | 5/16/2012 |
| | | 32% UAN | 3rd leaf | 6/7/2012 |
| | Green bean - Crop 2 | Liquid Manure | preplant | 7/13/2012 |
| | | Popper | planting | 7/17/2012 |
| | | 32% UAN | 3rd leaf | 8/7/2012 |
| 2013 | Potato | AMS | hilling | 5/22/2013 |
| | | Urea | hilling | 5/22/2013 |
| | | 32% UAN | hilling | 5/22/2013 |
| | | 32% UAN | 50% canopy | 6/11/2013 |
| | | Nitro 9 | 50% canopy | 6/11/2013 |
| | | Nitro 12 | Early bulking | 7/3/2013 |
| | | Nitro 12 | Late bulking | 7/15/2013 |
| 2014 | Field corn | Liquid Manure | preplant | 5/8/2014 |
| | | Starter | planting | 5/14/2014 |
| | | AMS | 5 lf stage | 6/12/2014 |
| | | 32% UAN | cultivation | 6/19/2014 |
| | | 32% UAN | tassel | 7/12/2014 |
| | | 32% UAN | silk | 7/31/2014 |
| 2015 | Pea | Liquid manure | preplant | 4/19/2015 |
| | | 32% UAN | blossom | 5/18/2015 |
| | Green bean | Liquid manure | preplant | 7/15/2015 |
| | | Starter | planting | 7/18/2015 |
| | | 32% UAN | 3rd leaf | 8/6/2015 |
| | | Starter | 3rd leaf | 8/6/2015 |
| | | Nitro 9 | blossom | 8/24/2015 |
| 2016 | Potato/alfalfa | Solid Manure | preplant | 1/7/2016 |
| | | Potato Starter | planting | 4/18/2016 |
| | | Popper | planting | 4/18/2016 |
| | | AMS | hilling | 5/5/2016 |
| | | 32% UAN | hilling | 5/10/2016 |
| | | 32% UAN | 50% canopy | 6/3/2016 |
| | | 32% UAN | Full canopy | 6/14/2016 |
| | | Nitro 9 | Late bulking | 6/14/2016 |